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# MAKING IT WORK: AN OVERVIEW OF THE JANUS PROJECT\*

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In August 1988, the Library was awarded a project grant from the UTS Vice Chancellor's Development Fund to evaluate the potential of information technology (IT) to assist the individual researcher with the process of information storage, retrieval and transfer. This paper places the project in historical context and outlines the elements of the model workstation. The name 'Janus Project' reflects the ability of this research to assist the library as both a user and provider of information services.

The first phase of the project is to build a prototype 'scholar's workstation' for use in library research and management by utilising and integrating appropriate new technology. It is hoped that this working model can then be used both to test further technological enhancements and to explore the use of expert systems to simplify the information retrieval process in other subject areas.

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*\* Based on a paper presented at Information Online in January 1989 at a session entitled 'Users and vendors: war and peace'*

## Introduction

Janus, the ancient Roman deity who kept the gate of heaven, was represented with two faces - one in front and one behind. The doors of his temple were thrown open

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in times of war and closed in times of peace. A library should also look in two directions - as both user and provider of information services. The fulfilment of dual roles can produce conflict. In libraries, the age old struggle between conservation and access has sometimes made our users think we are two-faced.

To the individual researcher or scholar, the dream of having 'knowledge at your fingertips' has not necessarily conjured a picture of the traditional library. For the university library at least, the dream of a separate library in every academic office has seemed more like a nightmare.

Can information technology enable us to resolve this conflict and to serve both the individual and the collective good? Are we now in a position to provide the individual researcher with the 'Clayton's library' - the library you have when you don't have a library?

## The Library and the project

The Library of the University of Technology, Sydney takes the 'Copernican'<sup>1</sup> view of library service - that is, user-centred rather than library-centred<sup>1</sup>. It seeks to use appropriate new technology to anticipate and respond to user needs and to make effective use of library resources. In the words of Richard de Gennaro, we are trying to make 'the resources within the library available beyond its walls, and the resources beyond its walls available in the library.'<sup>2</sup>

In August 1988, the Library was awarded a grant of \$14,000 from the UTS Vice-Chancellor's Development Fund to evaluate the potential of information technology to assist the individual researcher with the process of information storage, retrieval and transfer. Of the 31 applications from both academic and support staff, only 9 were successful and the Library project was among those receiving the most funds. From the level of interest shown since then, it is clear that this project has captured the imagination of many different sections of the University community.

The first phase of the project is to build a prototype 'scholar's workstation' for use in library research and management by utilizing and integrating appropriate new technology. It is hoped that this working model can then be used both to evaluate further technological developments and to explore the use of expert systems to simplify the information retrieval process in other subject areas.

In essence, the project seeks to respond to the challenge issued by Patricia Battin: 'to integrate information technology into the existing information system in a way that preserves the linkages to the existing knowledge base, encourages and stimulates the productive use of new technologies, and provides coordinated gateway access to the universe of knowledge in a manner convenient and invisible to the end user.'<sup>3</sup>

Any statement of the project objective includes three important concepts that need to be defined - library research and management, information technology and the 'scholar's workstation'.

## Concepts

### Library research and management

'Research' has been defined uncharitably in a NASA truism as 'reading two books that have never been read in order to write a third that will never be read'.<sup>4</sup> In the context of this project, I would prefer to adopt Michael Buckland's view that research leads to the reduction of uncertainty and that the research process can be applied to 'trying to solve the practical and conceptual problems associated with the provision of library services.'<sup>5</sup> The term 'management' has also been included to emphasise the need for any project outcomes to assist in the complex task of making the best use of the resources available to the library.

This subject area was chosen deliberately. If the project provides tangible benefits for library operations, then it will highlight the practical value of library research. If the prototype can be made to work for our own area of professional expertise, then it will be easier to use it as a starting point for others.

### Information technology

In the language of the online searcher, the term 'information technology' has yet to reach the dizzy heights of 'descriptor'. Even the editor of the *Concise Encyclopaedia of Information Technology* admits that the term is not easy to define or understand.<sup>6</sup> One way to approach a definition is to look at the two words separately.

'Information' can be defined as the record of human experience in any form - text, sound, symbol, graph, picture. The associated 'technology' provides the mechanisms which enable us to process, store, retrieve, analyse, synthesise and transmit these records. Some forms of 'information technology' have been in existence for centuries. In the last few decades, great advances have been made in the speed and flexibility of two of the mechanisms - the computer and the telecommunications network. In this decade, microcomputing and telecommunications technologies have converged because of one significant breakthrough - the ability to code and store all forms of information digitally.

Advances in information technology should now provide us with the opportunity to assist the individual researcher with all the aspects of the research process from a personal workbench - commonly referred to as the 'scholar's workstation'.

## Scholar's workstation

The dream of such a workstation was first expressed in 1945 in a landmark article by Vannevar Bush entitled 'As we may think'.<sup>7</sup> His main concern was with the difficulties confronting researchers in dealing with the information explosion - 'the summation of human experience is being expanded at a prodigious rate, and the means we use for threading through the consequent maze to the momentarily important item is the same as we used in the days of square-rigged ships.'

His proposal was to design an 'enlarged, intimate supplement' to the researcher's memory. He called this future device the 'memex' and described it as a 'mechanized private file and library' in which 'an individual stores his books, records and communications' so that they can be 'consulted with exceeding speed and flexibility'. He described a desk with projection panels for reading, and a microform storage area which could include locally photographed as well as commercially available material. Interaction would occur via a keyboard and a 'set of buttons and levers' and the researcher would be able to add marginal notes and comments to any material. Consultation of material would be made possible by both the 'usual scheme of indexing', the ability to scan the entire contents of the item rather than just a description of it and the provision of associative indexing or 'trail blazing' by the researcher so that related items could be easily retrieved.

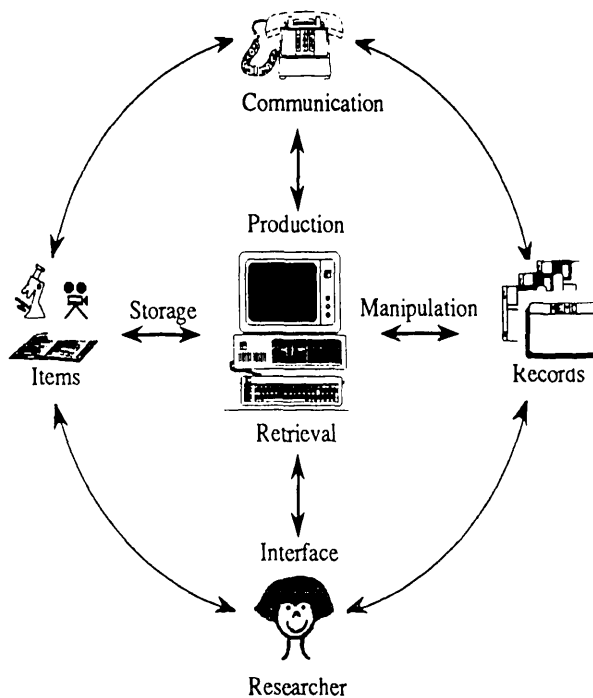
In a 1987 article entitled 'As we may think, revisited'<sup>8</sup>, Brunelle and McClelland re-examine Bush's predictions. Forty years on, they identify developments in telecommunications and artificial intelligence as the only significant trends that Bush had missed. Such a track record is impressive when compared with a prediction of the future made by the US Department of the Interior in 1937 - it missed only atomic energy, computers, radar, antibiotics and World War II.<sup>9</sup>

Brunelle and McClelland contend that most of the 'gadgetry' predicted by Bush already exists - so why isn't the 'memex' available? One answer is that most information users are struggling to catch up with what there is now - and are still just looking for better ways to do the same old things. These authors, like Bush, suggest that considerable economic investment will be required to see the dream become reality. This investment is needed most not for more 'gadgetry' but for the development of the tools which will allow the researcher to use the simplest possible methods to interact with the computer and to communicate and exchange information effectively with others.

So the concept of the scholar's workstation may also have two faces - like the ancient Chinese ideograph it can present us with a problem - or an opportunity. The outcome will probably depend on whether we are driving the technology or it is driving us. Hopefully, our attempt to build a prototype will at least give us a chance to learn the road rules.

What then are the basic elements of the model workstation?

## Elements of the model



The model consists of resources, processes and tools. All the elements have some relationship with each other. This trend towards combination or overlap is also reflected in many of the new information technology products and services that are becoming available.

### Resources

Research requires the curiosity, thought processes, skills and personality of the basic resource - the **researcher**. To make a contribution to an area of knowledge, the researcher consults and uses material in the form of physical **items** - books, articles, pictures, data - and **records** of items - bibliographic citations, notes, summaries.

## Processes

In essence, the research process is similar for most disciplines. It involves a statement of the problem, collection and storage of data, retrieval of related material, analysis and manipulation of results, production and distribution of the conclusions.

## Tools

At the heart of the model is the **microcomputer** - a fast, flexible and affordable tool which has the potential to assist with each phase of the research process. Fortunately, in this world of rapid change, the exact configuration becomes relevant only when we have specified what it is that we wish to do - and even then we will probably have to make some compromises.

To use this tool effectively, the researcher needs a way to **interact** both with the microcomputer and the world of information and contacts outside. **Interface** technology encompasses everything from the most cumbersome operating system manual through interaction via voice or natural language to expert systems which incorporate specific bodies of knowledge or problem solving skills. **Communication** includes such tools as voice and data transmission, communication managers, and gateways.

Using this basic model, what functions are we expecting the prototype to perform in the context of library research and management? What are some of the existing products and services available to us? What are some of the problems we are likely to encounter?

## Storage and Retrieval

Since storage is of little use without an adequate retrieval system, these two areas will be considered together. We will want to communicate with the remote databases - library catalogues, indexes and document delivery services - appropriate to the subject area.

## Databases

There are three major indexing databases covering our field - ERIC, LISA and Library Literature. In a recent article, Steig and Atkinson evaluate these databases and make some interesting conclusions: 'The databases of the information profession should serve as models; instead they are examples of a mixture of positive and negative elements. We have not taken advantage of the technology to control the literature of our own profession. We get the same partially satisfactory results we always got - faster and faster.'<sup>10</sup>

Apart from coverage and indexing policy, our use of these three databases also poses another problem - is online access or compact disc the answer? As usual, the choice will be governed by cost, frequency and ease of use - but there are implications for retrieval.

By providing hundreds of databases accessible via one search language and one strategy, online vendors like Dialog have helped to simplify the retrieval process. Compact disc has been hailed as one of the most exciting recent developments in storage and retrieval technology. While it provides the searcher with the 'Clayton's online service' - the one you have without the telecommunications bill - it does complicate the interface with the need to learn different retrieval languages. It is possible that developments in gateways - like iLINK and IntelNet - and expert system software - like TOMESearcher - may eliminate the need in future for us to learn any retrieval language at all. However, such developments will not decrease the value of the searcher - whose real skill is the construction of the effective search strategy. One likely approach for our prototype is to experiment with and evaluate as many alternatives as possible. For example, we could use ERIC Ondisc from Dialog, with the advantages of updating the same search strategy online and receiving SDI results via Dialmail. We could access Library Literature via IntelNet and purchase LISA on CD-ROM from Silverplatter.

Our own library catalogue is also an important database resource. The release of the CLANN Library Network Catalogue on CD-ROM in March 1989 gives us the choice of dial-up or compact disc access - or both - from our workstation. Similar access to other library catalogues, like ABN, will also be vital.

## **Document Delivery Services**

The same kinds of technology are being applied to the problem of locating the physical item. Online document ordering services like Dialorder and ILANET simplify the retrieval of items through the use of electronic mail. Increasing use of electronic publishing now means that more material is available for instant retrieval. The ADONIS project is an example of the combination of electronic publishing with CD storage technology to simplify the retrieval of the full contents of documents. The trend in storage technology - to fit more and more into less and less - is blurring the distinction between the physical item and its description. It is also highlighting the need for development of more appropriate and user-friendly retrieval mechanisms.

## **Manipulation and Production**

One of the major tasks for our workstation will be manipulation of material in a variety of formats. We will want to create and retrieve information about locally held



items, like reports and statistics, and save the records we have retrieved from remote databases. At this stage, a large proportion of this material will be textual records in the form of bibliographic data.

To manage these records we will need to consider both the structure of the database and the tools needed to manipulate records. The first choice is between the common, hierarchical structure employed by familiar database programs - like dBase or Oracle - and the non-linear, associative possibilities offered by hypertext. A second task is to evaluate the huge range of microcomputer text retrieval packages available - like ZyIndex, Inmagic and Isys. Specialised programs for downloading and citation management - like Procite and Bibliolink - will also be considered. The need for such bibliographic 'translators' points to one major problem that persists in database management and data sharing - the need for a 'standard communication format'<sup>11</sup> for bibliographic records.

Our workstation will also require tools to manipulate non-textual data. Spreadsheets and statistical packages will assist in the process of budgeting and the collection of management information. The production of a variety of documents, including annual reports and publicity material, will call for word processing, image processing, page layout and graphics capabilities. We will also need the means to distribute material electronically and in paper form.

## Conclusion

Can it be done, or are we really still in a state of 'memexia nervosa'?<sup>12</sup> Work on this project will give us the chance to find out. It will also give us the opportunity, like Janus, to look both outside as a provider of information and inside as a user of information. Looking in both directions should help us to improve our services. I will return to our theme of war and peace to let Vannevar Bush make the final comment: 'The applications of science have built man a well-supplied house, and are teaching him to live healthily therein. They have enabled him to throw masses of people against one another with cruel weapons. They may yet allow him truly to encompass the great record and to grow in the wisdom of race experience. He may perish in conflict before he learns to wield that record for his true good. Yet, in the application of science to the needs and desires of man, it would seem to be a singularly unfortunate stage at which to terminate the process, or to lose hope as to the outcome.'<sup>13</sup>

## References

- <sup>1</sup>Sack, J.R., 'Open systems for open minds: building the library without walls', *College and Research Libraries* (November 1986): p.538.
- <sup>2</sup>De Gennaro, R., *Libraries, technology and the information marketplace: selected papers*. Boston, G.K. Hall, 1987, p.11.
- <sup>3</sup>Battin, P., 'The electronic library', *Collection Management*, v.9, n. 2/3 (1987): p.133-134.
- <sup>4</sup>Crampon, J.E., 'Murphy, Parkinson and Peter: laws for libraries', *Library Journal*, (15 October 1988): p.131.
- <sup>5</sup>Buckland, M., 'Library research: problem solving or a contribution to the theory of librarianship' in *Research and the practice of librarianship: an international symposium*, eds G.G. Allen and F.C.A. Exon. Perth, Western Australian Institute of Technology, 1986, p.18.
- <sup>6</sup>Stokes, A.V., *Concise encyclopaedia of information technology*, 2nd ed, Gower, Aldershot, 1985, p. vii.
- <sup>7</sup>Bush, V., 'As we may think', *Atlantic Monthly*, (July 1945) 101-108.
- <sup>8</sup>Brunelle, B. and B. McClelland, 'As we may think, revisited', National Online Meeting, New York, 5-7 May 1987, *Proceedings*, pp. 41-46.
- <sup>9</sup>Benford, G., *Timescape*, Falmouth, Sphere, 1982, p. 298.
- <sup>10</sup>Steig, M.F. and J.L. Atkinson, 'Librarianship online: old problems, no new solutions', *Library Journal*, (1 October 1988): p. 58.
- <sup>11</sup>Brooks, T.A. and E.G. Bierbaum, 'Database management systems: new homes for migrating bibliographic records', *Library and Information Science Research* (October-December 1987): p.339.
- <sup>12</sup>Hegarty, K., 'Build your own CD public access catalog': *Library Journal* (July 1988): p. 43.
- <sup>13</sup>Bush, Op. cit. p. 108 [p. 20]